

CONTAINER5 Technical Field of the Invention

The invention relates to a container for pills, and to a method of forming such a container.

Background of the Invention

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Concerns for the safety of young children have led to the development of numerous 'child resistant' containers for pharmaceutical drugs in the form of pills, capsules or tablets. Examples of such containers are described and illustrated in UK Patent Specifications 1,527,812 and 2,319,244 and US Patent Specifications 3,923,180 and 5,575,399.

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Known examples of 'child resistant' containers have been successful in reducing the death rate from accidental poisoning among young children who have gained access to containers holding pharmaceutical drugs prescribed for others. The opening of such 'child resistant' containers has required both manual dexterity and some physical force; and may use a cognitive skill, like two step handling (e.g. push and turn). The combined requirement for

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children.

Notwithstanding this success, many patients for whom pharmaceutical drugs have been prescribed are elderly, infirm, or suffering from a condition (e.g. arthritis) which reduces their ability to open 'child resistant' containers. This has led to concerns about easy access to

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pharmaceutical drugs for elderly people having insufficient dexterity and/or strength in their hands to extract medication from known 'child resistant' containers.

These concerns have been addressed in two US Patent Specifications, 5,934,492 and 6,112,920. Both these specifications deal with the opening of a cap to give access to the body of a container. In '492, the cap is removable by the application of an adult sized finger. The

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finger of a young child would be too small to actuate a mechanical locking device to release the cap. In '920, the cap is removable by a combined downward pressure and counter clockwise rotation. With both specifications, access to the pills is achieved by the application of significant pressure to remove the whole of a cap, which seals the container. Neither of these specifications discloses provision for dispensing pills by an elderly person while restricting

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access to those pills by a young child.

Disclosure of the Invention

The invention provides a container for pills and the like, and having a closure which may be released by a compressive force applied between two opposed locations on the exterior, and  
5 which, after release, may be opened by application of pressure acting at right angles to the compressive force, the pressure causing the closure to rotate about an axis parallel to the direction of the compressive force, so to open an aperture leading to the interior of the container.

The invention also provides a container for pills and the like, and comprising a shell, a  
10 closure for that shell, a pivotal mounting in the shell for the closure so that the closure is arranged for rotation on an axis to rock between a closed position in which the closure seals the shell, and an open position in which the closure can dispense a pill or the like from the interior of the shell through an aperture, in which there is a detent arranged to secure the closure in its closed position, and a point on the surface of the shell to which pressure can be applied to  
15 release the detent and so allow the closure to be rocked from its closed position to its open position.

It is preferred that there are two opposed detents to secure the closure in its closed position, and two opposed points on the surface of the shell to which pressure can be applied to release the detents and so allow the closure to be rocked from its closed position to its open  
20 position.

In one form, pressure to release the closure member is applied directly. In an alternative form, pressure to release the closure is applied through a suitably flexible point or points on an external part or parts of the container or container shell.

It is preferred that the aperture is on the opposite side of the axis to the position of  
25 application of pressure.

It is preferred that the container has an associated small sealable space for safe retention of a pill or a portion of a pill.

It is further preferred that the small sealable space is located in the closure.

In one preferred configuration there is an additional button on the back of the closure  
30 member to increase child resistance.

In another preferred configuration, a sleeve or channel is used both to hold the container together and to carry notices or directions relating to pills to be stored in the container.

The invention also provides a method of forming a container as described above, the method comprising the steps of arranging two half portions of the container in proximity with  
35 each other, with the closure trapped between parts adapted to allow rocking movement of the closure, and then locking the two half portions together with a sleeve or channel.

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In one preferred form of the method, the two half portions are connected together along a flexible hinge line, so that they can be arranged in proximity with each other by folding them together about the hinge line.

In an alternative form of the method, the two half portions are brought into proximity with each other as separate entities.

#### Brief Description of the Drawings

A specific embodiment of the invention and variants thereof will now be described by way of example with reference to the accompanying drawings, in which :-

Figure 1 is a view from one side and slightly above a container for pills or the like;

Figure 2 is a view from one end and above that container with a small sealable space open;

Figure 3 is a side elevation;

Figure 4 is an end elevation;

Figure 5 is a similar end elevation showing operability of the container;

Figure 6 is a transparent view of the container, showing operable parts;

Figure 7 is a perspective view showing a closure for the container;

Figure 8 is a sketch of a top portion of a non child-resistant variant of the container;

Figure 9 is a cross sectional view showing a vertical section through that container;

Figure 10 is a sketch of a top portion of another variant of the container, showing an additional child resistant feature:

Figure 11 is a cross sectional view showing a vertical section through the top of the variant shown in Figure 10;

Figures 12 and 13 are cross sectional views showing transverse cross sections through a container, and illustrating operability of detents to secure the container in a closed condition;

Figure 14 is a diagram showing a first stage in assembly of the container shown in Figs 1 to 6;

Figure 15 is another diagram showing that stage in assembly of the container;

Figure 16 is a diagram showing a second stage in the assembly of the container; and

Figures 17 to 19 are diagrams corresponding to Figures 14 to 16, and showing another method of assembly.

#### Description of the Specific Embodiments

A container for pills, capsules, tablets or the like is shown in Figures 1 to 6. The container has a hollow shell 10, surmounted by a closure member 11. The closure member 11 is arranged to rock on an axis between trunnions 12 (best seen in Figures 6 and 7), so that it is movable between a closed position, in which it seals the shell, and an open position, in which it

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is possible for a pill or the like to be dispensed from the interior of the shell. As shown in Figures 1 to 4, the container is standing on a flat horizontal surface, and the trunnions 12 lie on a horizontal axis.

When the closure member 11 is in its closed position, a shield portion 14 on the member 11 blocks a notch 15 in the top of the shell 10. When the member 11 is in its open position, the shield portion 14 is raised to allow access to the interior of the shell 10 through the notch 15. Thus by rocking the closure member 11, pills can be dispensed from the interior of the shell 10.

To prevent unauthorised access to the pills by young children, the container has a locking mechanism. The locking mechanism comprises two opposed points 16 on the surface of the shell 10. The points 16 are formed as very thin layers of the plastic shell, and are sufficiently flexible to permit inward deflection (i.e. towards each other). On the closure member 11 there are dependent buttons 17, which are supported from the member 11 by short flexible strips 18. The flexibility of the strips 18 allows pressure on the points 16 to deflect the buttons 17 inwardly within the shell 10. Inward deflection of the buttons 17 allows the buttons to disengage from detents (not shown in Figures 1 to 7, but well illustrated in Figures 12 and 13 relating to a variant of the container). In another form, the points 16 are formed as open holes which allow direct access to the buttons 17.

Thus operation of the container to dispense pills is a two stage process as illustrated in Figure 5. First the opposed points 16 are pressed towards each other by pressure A. This releases the buttons 17 from the detents. Second, downward pressure B on the end of the closure member 11 nearer to the points 16 allows the member 11 to rock on the trunnions 12, and so opens the notch 15 to allow a pill to be dispensed. In a specific mode of operation, a person wishing to dispense a pill would lift the container in one hand, exert pressure A using thumb and middle finger, and then, when the closure member was unlocked, open the closure member 11 by applying downward pressure B with their fore finger. Inversion of the container then dispenses a pill.

Sequential application of two gentle pressures at right angles to each other requires the mental process of an adult which would be beyond the competence of most young children, while allowing single handed operation. Two handed operation is also possible.

To allow for circumstances in which a user may only require the dose contained in one half of a normal sized pill, provision is made for the temporary retention of an unused half pill. As shown particularly in Figures 2, 6 and 7, the end of the closure member 11 nearer to the shield portion 14 has a small sealable space 20. The space 20 is closed by a lid 19. The lid 19 is hingedly mounted on the closure member 11 by a short flexible strap 21. The strap 21 allows the lid 19 to be moved upwardly away from the space 20 to allow insertion or removal of a pill or half a pill as the user may require.

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Two variants of containers according to the invention are shown in Figures 8 and 9, and Figures 10 and 11 respectively.

Figures 8 and 9 show a shell 30 associated with a closure member 31, which is rockable on trunnions 32. The shell has a notch 35, and the closure member 31 has a shield portion 34. 5 Unlocking of the closure member 31 (not shown in Figures 8 and 9), followed by depression of the closure member by pressure B', allows the dispensing of a pill from within the shell 30. In the absence of a locking mechanism, this variant is less child resistant.

Figures 10 and 11 show a second variant of a container according to the invention, having an additional child resistant feature. In this case a shell 40 has a closure member 41, and after 10 unlocking, and depression of additional button 50, pressure B'' rocks the closure member anticlockwise (as seen in figure 11) to allow the dispensing of a pill from within the shell 40.

In Figures 12 and 13, the shell 40 has apertures 46a, through which buttons 47 can be pushed inwardly through the shell 40 to release the closure member 41. Figure 12 shows the buttons 47 being pushed together by pressure A'', and Figure 13 shows the closure member 41 15 being pushed down by pressure B''. In this case the flexible points 16 of the embodiment shown in Figures 1 to 7 are not required, as pressure A'' is applied directly to the buttons 47.

It will be understood that the provision of two opposed points with two dependent buttons is not essential to the operation of the container according to the invention. A single point with sufficient flexibility to allow a button to be released from a detent, or a single direct acting button 20 which could be released from a detent, could be used to unlock the closure member in respective containers.

Two methods of assembly for containers according to the invention are shown in Figures 14 to 16 and 17 to 19 respectively. Both methods will be described with reference to the container shown in Figures 1 to 7.

25 As shown in Figures 14 and 15, the shell 10 is moulded in two halves 10a and 10b, joined along a flexible hinge line 22. The container is assembled by pivoting the halves 10a and 10b upwardly together. As the two halves are nearly in contact with each other, the closure member 11 is positioned between them, so that trunnions 12 engage with pivot holes (not shown) on the inside of the shell 10. The two halves 10a and 10b are forced together, so trapping the buttons 30 17 in proximity with the flexible points 16. A 'U' shaped channel 23 is then forced over the halves 10a and 10b (as shown in Figure 16) to keep those halves permanently on contact with each other. As shown particularly in Figures 1, 2 and 3, the 'U' shaped channel 23 may be used to carry promotional material, and/or written description of the contents and dosage of the pills to be kept in the container. Thus a single shell 10 formed as a single moulding could be 35 used for many different pills, with the channel 23 being used to identify the particular pills within the container.

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An alternative method of assembly is shown in Figures 17 to 19. In this case, the two halves of the shell are formed as discrete parts (i.e. un-joined by any hinge line 22). As with the method shown in Figures 14 to 16, the two half shells 10a and 10b are brought together around the closure member 11. A 'U' shaped channel 23 is then forced over the halves to keep those halves permanently in contact with each other.

#### Advantages of the Invention

The purpose of the container is to prevent access by children to pharmaceutical drugs within the container, while allowing elderly or infirm adults to have easy access to those drugs.